

Y-12 National Security Complex Ten-Year Site Plan

FY 2008-2017

March 2007

prepared by
Y-12 National Security Complex
P.O. Box 2009, Oak Ridge, Tennessee 37831-8169
managed by
BWXT Y-12, L.L.C.
for the
U.S. DEPARTMENT OF ENERGY
under contract
DE-AC05-00OR22800



Theodore D. Sherry, Manager, Y-12 Site Office



George E. Dials, President and General Manager,
BWXT Y-12, L.L.C.

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Site Description

2.1 General Site Description

BWXT Y-12, L.L.C., a BWXT and Bechtel enterprise, operates Y-12 NSC for NNSA, having been awarded the contract for management and operation on November 1, 2000. Y-12 is one of eight NNSA sites comprising the Nuclear Weapons Complex (NWC) (Fig. 3).

Y-12 NSC is located on DOE's Oak Ridge Reservation (ORR), which covers approximately 34,000 acres (Fig. 4). Most of the ORR lies within the corporate limits of the city of Oak Ridge, Tennessee, and is located approximately 2 miles southwest of its population center. The ORR is bordered on the north and east by the city and on the south and west by the Clinch River/Melton Hill Lake impoundment. Knoxville, the largest city in east Tennessee, is located approximately 15 miles east of the ORR.

In addition to Y-12, the ORR is home to Oak Ridge National Laboratory (ORNL) and East Tennessee Technology Park (ETTP). ORNL is managed and operated through a partnership between The University of Tennessee and Battelle, known as UT Battelle, for DOE-SC/NE. The Bechtel Jacobs Company (BJC) operates the ETTP under a management and integration-type contract for DOE-EM. The ORR contains approximately 3500 acres of waste

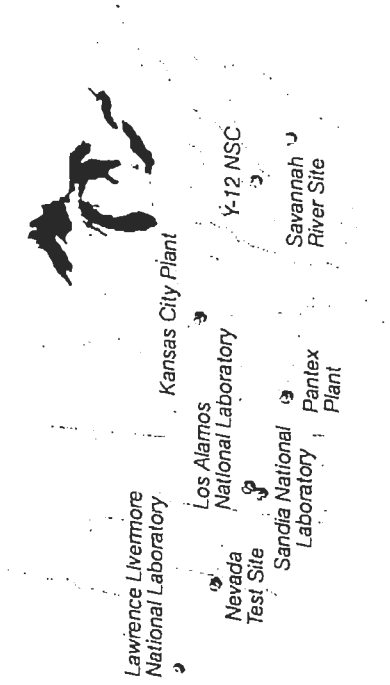


Fig. 3. The NNSA Nuclear Weapons Complex, which encompasses design laboratories, weapon component production plants, and the test site.

sites or remediation areas. The large land area surrounding the developed site areas and waste sites serves as a buffer between DOE activities and the city of Oak Ridge. This buffer is used primarily for

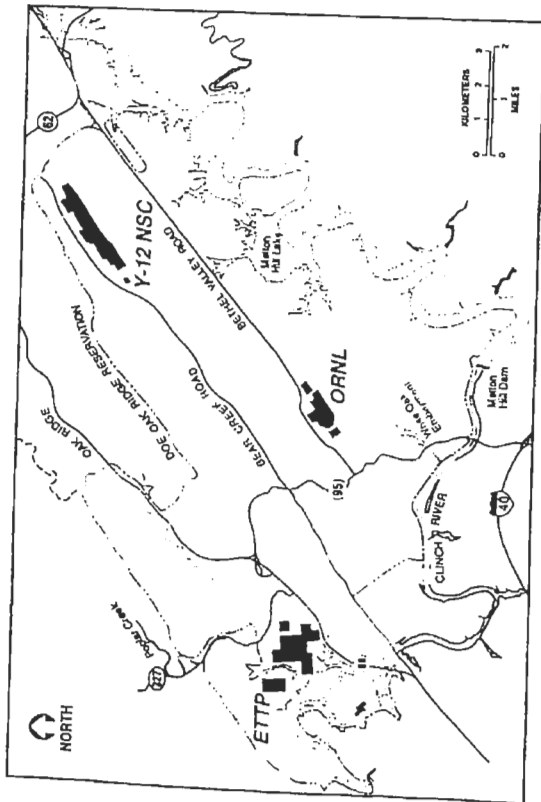


Fig. 4. The ORR, home to three principal DOE installations and host to numerous programs and activities for DOE and NNSA.

environmental research, utilities, protection of natural and cultural resources, wildlife management, and limited recreation.

The industrialized area of the Y-12 site covers approximately 800 acres, nearly 600 acres of which are enclosed by perimeter fences. The main site, which has controlled access, is roughly 2.5 miles in length and 0.5 mile wide. Private development exists on the northern and eastern boundaries of the site. As of February 2007, a BWXT Y-12 workforce of approximately 4500 people supports NNSA-related activities. The total site population, which includes the NNSA Y-12 Site Office (YSO) and several other subcontractors supporting other DOE/NNSA activities, can vary between 6000 and 6500 people.

At the end of January 2007, real property on Y-12 NSC includes over 440 buildings with a floor area of approximately 7.1 million square feet (Fig. 5). Other key site infrastructure on Y-12 NSC includes:

- Over 15 miles of roads
- 70 acres of parking areas
- 20 miles of sanitary sewer
- 24 miles of treated water
- 5 industrial gas plants, with 12 miles of distribution lines
- 18 cooling towers
- 2 substations, and 25 miles of electrical distribution lines

While NNSA is responsible for 74% of the floor space (5.3 million square feet), other DOE program offices have responsibility for the remaining 26% (Fig 6). DOE-SC/NE owns approximately 1.2 million square feet, and DOE-EM owns approximately 0.6 million square feet. As defined by DOE Order 430.1B, *Real Property Asset Management*, and the subsequent DOE guidance, the Asset Utilization Index (AUI) for the NNSA-controlled space is currently 88.45%, and the sitewide AUI is 76.87%. NNSA currently leases approximately 157,000 ft² of office and site support space in six facilities located off site.

Approximately 48% of all the NNSA-controlled floor space on Y-12 NSC was constructed prior to 1950 as part of the Manhattan Project (Fig. 7). A significant portion of the NNSA floor space (almost 50%) contains nuclear material processing, manufacturing, and storage operations which are performed in a strict, conduct-of-operations manner. Replacing some of these 65-year-old legacies of the Manhattan Project era is a key strategic objective of BWXT Y-12 and is consistent with NNSA Complex 2030.

Figure 8 illustrates the various facility use codes for the NNSA-controlled floor space on Y-12 NSC as of January 2007. For simplification, the Facility Information Management System (FIMS) code for the Institutional Use was combined with the Service Use code in the descriptions below. Other structures and facilities are not included in the totals. As shown, the Production/Manufacturing use code comprises over 50% of the NNSA floor space, the majority being constructed over 60 years ago. Additional information on each use code is provided below.

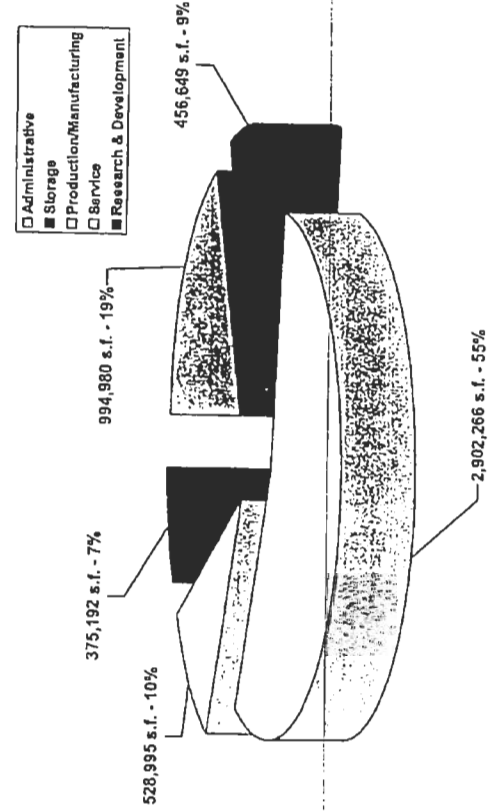


Fig. 8. NNSA facility use on Y-12 NSC.

Administrative. This category generally includes freestanding office or other structures that house technical, administrative, and management functions. The 994,980 ft² in this category contains a

number of older facilities that were not designed for their current use.

A significant amount of this floor space (over 290,000 ft²) will be demolished when the Jack Case and New Hope Centers are completed.

Production/Manufacturing. The 2,902,266 ft² contained in this category includes the original WWII process facilities built in the 1940s and 1950s. These are commonly referred to as the Alpha and Beta buildings. Alpha buildings housed the initial process for separating uranium-235 from uranium-238, the Beta buildings contained the processing equipment for the second step. These are the largest facilities on the Y-12 site, as evidenced by only six facilities representing 1,732,537 ft² of the total space in this category. These Alpha and Beta buildings have been reused continuously for over 60 years. Over 900,000 ft² of this space is projected to become excess to NNSA's needs in the next 2 to 3 years,

Research and Development. For the NNSA-controlled facilities, this category includes materials development laboratories housing BWXT Y-12's Applied Technologies organization. This use code totals 375,192 ft². The Y-12 Applied Technology Organization is the primary occupant in Buildings which total 171,109 ft² in this category.

Service. This FIMS category (combined with the Institutional code) includes numerous facilities such as maintenance shops, utility structures, changehouses, medical and food service facilities, and sampling laboratories. Over 200 facilities are represented in this group with a combined total of 530,154 ft². A vast majority of these buildings are less than 10,000 ft².

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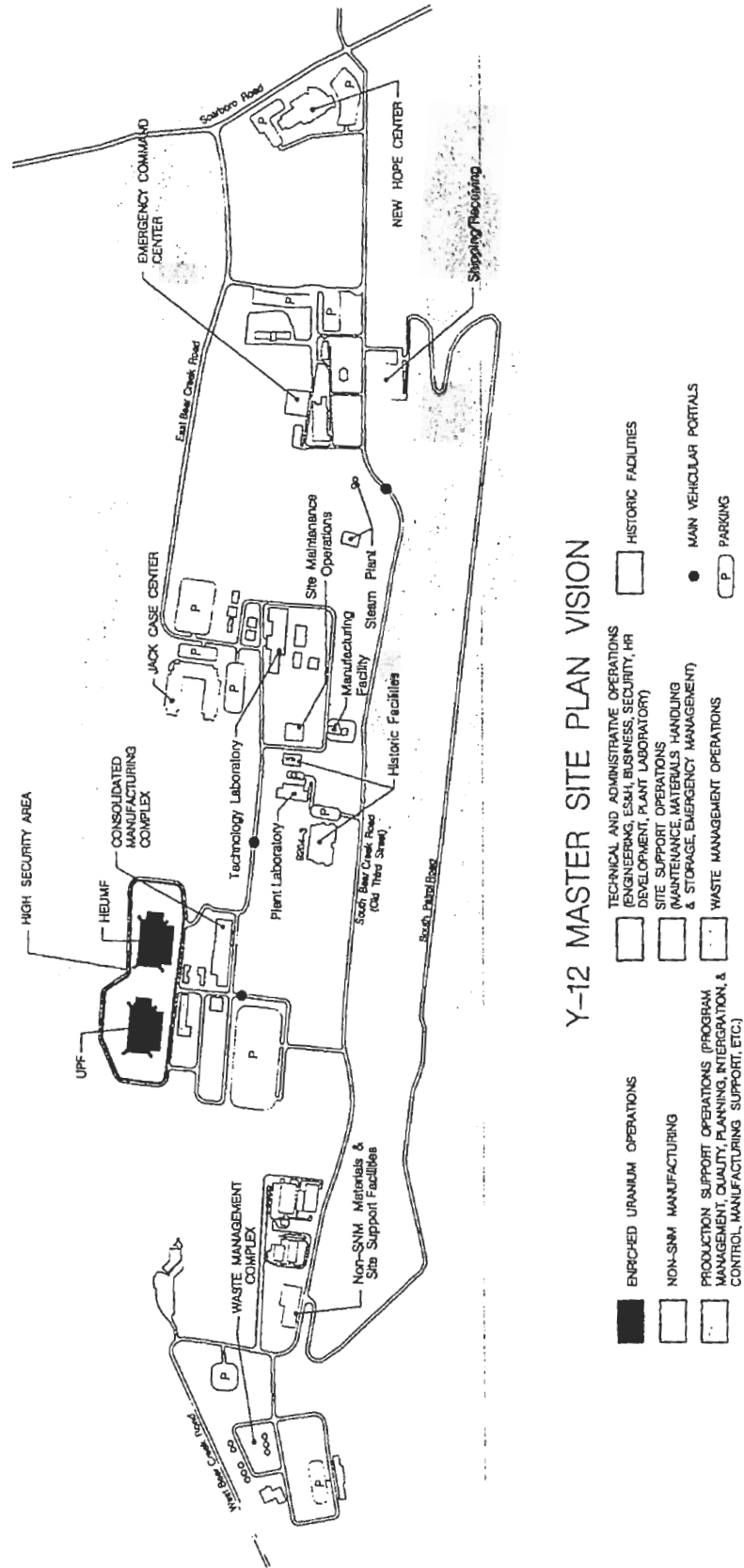
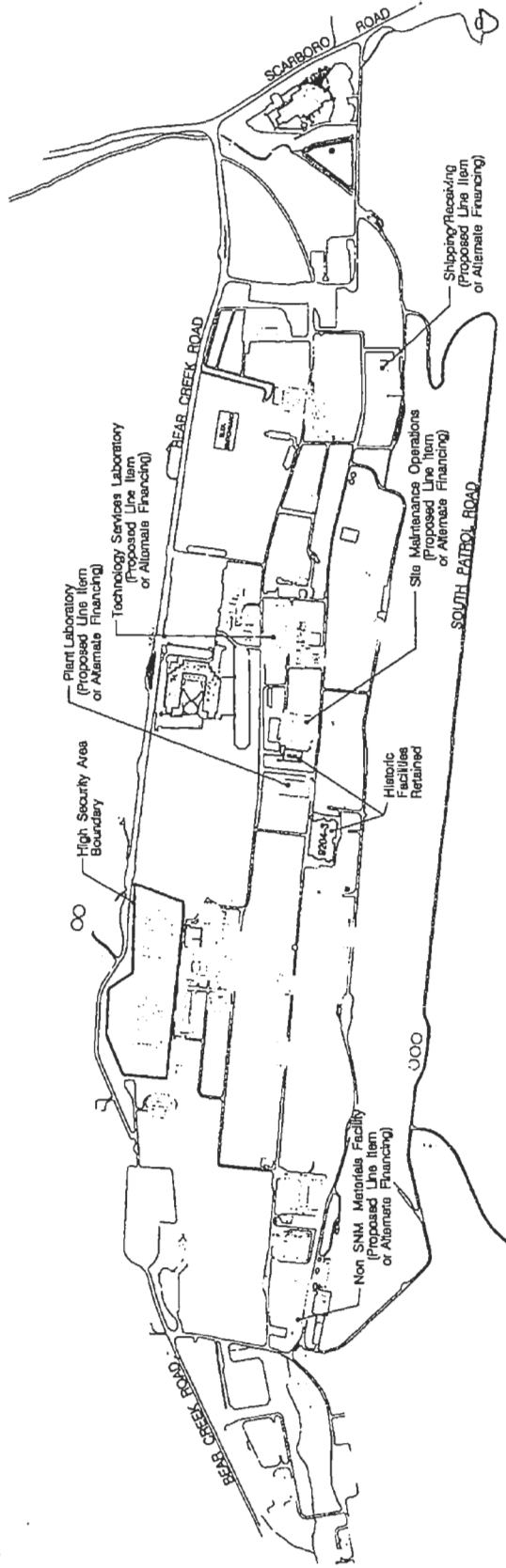


Fig. 12. Master site plan vision for Y-12 NSC.



Fifteen Year State: FY 2022

Footprint Data	Total Site Footprint	NNSA Only EOP 1.2022
Operating Footprint DSD	2,718,551 SF	2,473,873 SF
Shutdown Footprint DSD	200,000 SF	0 SF
DSD in Progress	2,718,551 SF	2,473,873 SF
Total Excess	0 SF	0 SF
Total Site Footprint	2,718,551 SF	2,473,873 SF

Fig. 17. Configuration of Y-12 NSC, FY 2018-2022.

The JTA program will provide flight test assemblies and components in accordance with schedule requirements defined by LLNL and LANL and implemented through the NNSA program control documents. JTA production is expected to decrease in FY 2010 and thereafter be sustained at the newly established level.

Y-12 must maintain and/or provide the capabilities to meet QE, shelf-life, and/or test hardware program requirements for the following weapons systems on the basis of schedules provided by NNSA:

B61	B61-3 JTA-9
B83	W76 High Fidelity JTA
W76	W76 JTA-1,2,7
W78	W78 JTA-5,6
W80	W87-1 JTA-3,4
W87	W88 JTA-1,2,3,4
W88	

Retired Weapons

Retired Weapons Program resources provide for the receipt, dismantlement, and disposition of weapons systems components returned from the nuclear stockpile. Weapons components returned to Y-12 are received primarily from Pantex following initial dismantlement.

Dismantlement includes all activities associated with weapons retirement, disassembly, component characterization, and disposition of materials and components.

Administrative, operational, security, and safety procedures are developed, and tooling is designed and fabricated for each dismantlement system. Components may require demilitarization, sanitization, and/or decontamination depending on the disposition path.

(b)(2)High

(b)(2)High

Dismantlement, storage, and disposition have provided an ongoing workload for Y-12, driven primarily by material reuse requirements, stockpile reduction, and treaty obligations.

Y-12 must maintain and/or provide the capability to perform dismantlement and disposition on the following weapons systems based on schedules provided by NNSA.

B43	W56	W76
B53	W59	W78
B61	W62	W79
B83	W68	W80
W48	W69	W84
W49	W70	W87
W55	W72	W88

Current projections show weapon receipts from Pantex will peak again in 2008 and then rise throughout the 10-year planning period. Implementation of the Nuclear Posture Review (NPR)

recommendations and continued pressure to reduce the stockpile are expected, which will impact this workload. Continued initiatives to increase capacity are expected. Overall, dismantlements are expected to be sustained at a high level to address material demands, storage issues, and treaty requirements. Similarly, demilitarization, sanitization, and disposition activities will increase to reduce the space required for the storage and security of excess materials and classified parts generated by dismantlement operations.

Stockpile Packaging

The Stockpile Packaging Program provides safe, secure, efficient, and economical containerization for the transport of radioactive materials and nuclear components within Y-12 NSC and between Y-12 and other approved sites. Packages and package components are developed, designed, procured, tested, certified, maintained, and used in accordance with DOE directives, federal and state regulations, and other applicable national standards.